

## SEQUENCE LISTING

<110> Inouye, Masayori  
Zhang, Junjie  
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Qing, Guoliang  
Suzuki, Motoo

<120> mRNA Interferases and Methods of Use Thereof

<130> University of Medicine & Dentistry of New Jersey (601-1-131PCT)

<140> Not yet assigned

<141> 2004-06-14

<150> 60/543,693

<151> 2004-02-11

<150> 60/478,515

<151> 2003-06-13

<160> 92

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 336

<212> DNA

<213> E. coli

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aacaaaacag gtatgtgtct gtgtgttcct tgtacaacgc aatcaaaaagg atatccgttc 180
gaagttgttt tatccgggtca ggaacgtgat ggcgtagcgt tagctgatca ggtaaaaagt 240
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ctcattaaag ccaaaattaa cgtactgatt gggtag 336
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<210> 2

<211> 111

<212> PRT

<213> E. coli

<400> 2

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1 5 10 15
Phe Asp Pro Thr Lys Gly Ser Glu Gln Ala Gly His Arg Pro Ala Val
20 25 30
Val Leu Ser Pro Phe Met Tyr Asn Asn Lys Thr Gly Met Cys Leu Cys
35 40 45
Val Pro Cys Thr Thr Gln Ser Lys Gly Tyr Pro Phe Glu Val Val Leu
50 55 60
Ser Gly Gln Glu Arg Asp Gly Val Ala Leu Ala Asp Gln Val Lys Ser
65 70 75 80
Ile Ala Trp Arg Ala Arg Gly Ala Thr Lys Lys Gly Thr Val Ala Pro
85 90 95
Glu Glu Leu Gln Leu Ile Lys Ala Lys Ile Asn Val Leu Ile Gly
100 105 110
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<210> 3  
 <211> 333  
 <212> DNA  
 <213> E. coli

<400> 3  
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 ggaacgcggc cgggtgctgat tgtcacaccg gcggccttta atcgcgtgac ccgcctgcct 120  
 gttgttgtgc ccgtaaccag cggaggcaat tttgcccgca ctgccggctt tgcggtgtcg 180  
 ttggatgggtg ttggcatagc taccacaggt gttgtacgtt gcgatcaacc ccggacaatt 240  
 gatatgaaag cacggggcgg aaaacgactc gaacgggttc cggagactat catgaacgaa 300  
 gttcttggcc gcctgtccac tattctgact tga 333

<210> 4  
 <211> 110  
 <212> PRT  
 <213> E. coli

<400> 4  
 Met Glu Arg Gly Glu Ile Trp Leu Val Ser Leu Asp Pro Thr Ala Gly  
 1 5 10 15  
 His Glu Gln Gln Gly Thr Arg Pro Val Leu Ile Val Thr Pro Ala Ala  
 20 25 30  
 Phe Asn Arg Val Thr Arg Leu Pro Val Val Val Pro Val Thr Ser Gly  
 35 40 45  
 Gly Asn Phe Ala Arg Thr Ala Gly Phe Ala Val Ser Leu Asp Gly Val  
 50 55 60  
 Gly Ile Arg Thr Thr Gly Val Val Arg Cys Asp Gln Pro Arg Thr Ile  
 65 70 75 80  
 Asp Met Lys Ala Arg Gly Gly Lys Arg Leu Glu Arg Val Pro Glu Thr  
 85 90 95  
 Ile Met Asn Glu Val Leu Gly Arg Leu Ser Thr Ile Leu Thr  
 100 105 110

<210> 5  
 <211> 249  
 <212> DNA  
 <213> E. coli

<400> 5  
 atgatccaca gtagcgtaaa gcgttgggga aattcaccgg cgggtgcggat cccgggctacg 60  
 ttaatgcagg cgctcaatct gaatatgtat gatgaagtga agattgacct ggtggatggc 120  
 aaattaatta ttgagccagt gcgtaaagag cccgtattta cgcttgctga actggtcaac 180  
 gacatcacgc cggaaaacct ccacgagaat atcgactggg gagagccgaa agataaggaa 240  
 gtctggttaa 249

<210> 6  
 <211> 82  
 <212> PRT  
 <213> E. coli

<400> 6  
 Met Ile His Ser Ser Val Lys Arg Trp Gly Asn Ser Pro Ala Val Arg  
 1 5 10 15  
 Ile Pro Ala Thr Leu Met Gln Ala Leu Asn Leu Asn Ile Asp Asp Glu  
 20 25 30  
 Val Lys Ile Asp Leu Val Asp Gly Lys Leu Ile Ile Glu Pro Val Arg  
 35 40 45  
 Lys Glu Pro Val Phe Thr Leu Ala Glu Leu Val Asn Asp Ile Thr Pro  
 50 55 60  
 Glu Asn Leu His Glu Asn Ile Asp Trp Gly Glu Pro Lys Asp Lys Glu  
 65 70 75 80  
 Val Trp

<210> 7  
 <211> 258  
 <212> DNA  
 <213> E. coli

<400> 7  
 atgcataacca cccgactgaa gaggggttggc ggctcagtta tgctgaccgt cccaccggca 60  
 ctgctgaatg cgctgtctct gggcacagat aatgaagttg gcatgggtcat tgataatggc 120  
 cggctgattg ttgagccgta cagacgcccg caatattcac tggctgagct actggcacag 180  
 tgtgatccga atgctgaaat atcagctgaa gaacgagaat ggctggatgc accggcgact 240  
 ggtcaggagg aaatctga 258

<210> 8  
 <211> 85  
 <212> PRT  
 <213> E. coli

<400> 8  
 Met His Thr Thr Arg Leu Lys Arg Val Gly Gly Ser Val Met Leu Thr  
 1 5 10 15  
 Val Pro Pro Ala Leu Leu Asn Ala Leu Ser Leu Gly Thr Asp Asn Glu  
 20 25 30  
 Val Gly Met Val Ile Asp Asn Gly Arg Leu Ile Val Glu Pro Tyr Arg  
 35 40 45  
 Arg Pro Gln Tyr Ser Leu Ala Glu Leu Leu Ala Gln Cys Asp Pro Asn  
 50 55 60  
 Ala Glu Ile Ser Ala Glu Glu Arg Glu Trp Leu Asp Ala Pro Ala Thr  
 65 70 75 80  
 Gly Gln Glu Glu Ile  
 85

<210> 9  
 <211> 24  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> T54 to K77 fragment of E. coli MazE

<400> 9  
 Thr Leu Ala Glu Leu Val Asn Asp Ile Thr Pro Glu Asn Leu His Glu  
 1 5 10 15  
 Asn Ile Asp Trp Gly Glu Pro Lys  
 20

<210> 10  
 <211> 18  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> N60 to K77 fragment of E. coli MazE

<400> 10  
 Asn Asp Ile Thr Pro Glu Asn Leu His Glu Asn Ile Asp Trp Gly Glu  
 1 5 10 15  
 Pro Lys

<210> 11  
<211> 30  
<212> RNA  
<213> Artificial Sequence

<220>  
<223> synthetic RNA substrate

<400> 11  
uaagaaggag auauacauau gaaucaaauc

30

<210> 12  
<211> 50  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> single stranded oligonucleotide

<400> 12  
gctcgtatct acaatgtaga ttgatatata ctgtatctac atatgatagc

50

<210> 13  
<211> 50  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> single stranded oligonucleotide

<400> 13  
cgagcataga tgttacatct aactatatat gacatagatg tatactatcg

50

<210> 14  
<211> 23  
<212> DNA  
<213> Artificial Sequence

<400> 14  
agatctcgat cccgcaaatt aat

23

<210> 15  
<211> 27  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> DNA primer

<400> 15  
ttagagatca atttcctgcc gttttac

27

<210> 16  
<211> 22  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> DNA primer

<400> 16  
ttaaagatcg tcaacgtaac cg

22

<210> 17  
<211> 22  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> DNA primer

<400> 17  
tgctctttat cccacgggca gc

22

<210> 18  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> DNA primer

<400> 18  
gcccagttca ccgcaagat cgtc

24

<210> 19  
<211> 27  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> DNA primer

<400> 19  
ggttttgatt tgctcccaac gggcaag

27

<210> 20  
<211> 27  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> DNA primer

<400> 20  
catttcctcc tccagtttag cctgggc

27

<210> 21  
<211> 27  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> DNA primer

<400> 21  
ttgccagact tcttccattg tttcgag

27

<210> 22  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> DNA primer

<400> 22  
gatccccaca atgcggtgac gagt

24

<210> 23  
<211> 24  
<212> DNA  
<213> Artificial Sequence  
  
<220>  
<223> DNA primer  
  
<400> 23  
cacgttggtcc actttgttca ccgc 24  
  
<210> 24  
<211> 24  
<212> DNA  
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<220>  
<223> DNA primer  
  
<400> 24  
cagttcagcg ccgaggaaac gcat 24  
  
<210> 25  
<211> 24  
<212> DNA  
<213> Artificial Sequence  
  
<220>  
<223> DNA primer  
  
<400> 25  
gcgttcgtcg tcggcccaac cgga 24  
  
<210> 26  
<211> 30  
<212> RNA  
<213> Artificial Sequence  
  
<220>  
<223> antisense RNA  
  
<400> 26  
gauuugauuc auauguauau cuccuucua 30  
  
<210> 27  
<211> 30  
<212> DNA  
<213> Artificial Sequence  
  
<220>  
<223> complementary DNA  
  
<400> 27  
gatttgattc atatgtatat ctccttctta 30  
  
<210> 28  
<211> 22  
<212> DNA  
<213> Artificial Sequence  
  
<220>  
<223> DNA primer  
  
<400> 28  
agaatgtgcg ccatttttca ct 22

<210> 29  
<211> 9  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> DNA fragment

<400> 29  
taatacacc

9

<210> 30  
<211> 15  
<212> DNA  
<213> Artificial Sequence

<400> 30  
atgaatcaca aagtg

15

<210> 31  
<211> 18  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> DNA fragment

<400> 31  
catcatcatc atcatcat

18

<210> 32  
<211> 12  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> DNA fragment

<400> 32  
atcgaaggta gg

12

<210> 33  
<211> 60  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> multiple cloning site

<400> 33  
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<210> 34  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> DNA primer

<400> 34  
caggagauac cucaaugauc a

21

<210> 35  
 <211> 21  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> DNA primer

<400> 35  
 ctcaatgatc acaggagata c

21

<210> 36  
 <211> 21  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> DNA primer

<400> 36  
 tcctctatgg agttactagt g

21

<210> 37  
 <211> 16  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> DNA primer

<400> 37  
 gggacaggag atacct

16

<210> 38  
 <211> 23  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> DNA primer

<400> 38  
 tgtcctctat ggagttacta gtg

23

<210> 39  
 <211> 330  
 <212> DNA  
 <213> Bacillus halodurans

<400> 39  
 atgccagtac cggatagagg gaatcttggt tatgtagact ttaaccacaca atcggggtcat 60  
 gaccaagccg ggacacgacc ggctattggt ttgtccccta aattatttaa taaaaacaca 120  
 ggttttgccg tggtttgccc aattaccaga caacaaaaag gttatccttt tgaaatagaa 180  
 ataccaccg ggttacctat tgaaggggtt attcttactg accaagtaaa aagtctggat 240  
 tggagagcaa gaaactttca cattaaagga caagcaccag aggaaactgt tactgattgt 300  
 ttacaactta ttcatacatt tttatcttaa 330

<210> 40  
 <211> 363  
 <212> DNA  
 <213> Staphylococcus epidermidis

<400> 40  
 atgattagaa gaggagatgt ttatttagcg gatttatcac cagttcaagg gtctgaacaa 60  
 gggggagtaa gacctgtagt tatcattcaa aatgatactg gtaataaata tagtccaact 120  
 gtaattgtag ctgcgattac tgatgggatt aataaagcga aaataccaac ccacgtagaa 180



attgaaaaga aaaagtataa attagacaaa gattcagtta ttcttcttga acaaattaga 240  
acactagata aaaagcgttt aaaagaaaaa ttaacatttt tatcagagag taaaatgata 300  
gagggtgata atgccttaga tattagtttg ggattaaata actttgatca tcataaatct 360  
taa 363

<210> 41

<211> 411

<212> DNA

<213> *Staphylococcus aureus*

<400> 41

atgattagac gaggagatgt ttatttagca gatttatcac cagtacaggg atctgaacaa 60  
gggggagtc gacctgtagt cataattcaa aatgatactg gtaataaata tagtcctaca 120  
gttattgttg cggcaataac tggtaggatt aataaagcga aaataccgac acatgtagag 180  
attgaaaaga aaaagtataa gttggataaa gactcagtta tattattaga acaaattcgt 240  
acacttgata aaaaacgatt gaaagaaaaa ctgacgtact tatccgatga taaaatgaaa 300  
gaagtagata atgcactaat gattagttta gggctgaatg cagtagctca accagaaaaa 360  
ttaggcgtct atttatatgta tttttcagag ataaataaaa tattgatata a 411

<210> 42

<211> 351

<212> DNA

<213> *Bacillus subtilis*

<400> 42

ttgattgtga aacgcggcga tggttatattt gctgatttat ctctgttgt tggctcagag 60  
caaggcggg tgcccccgtt tttagtgtat caaaatgaca tcggaaatcg ctccagccca 120  
actgctattg ttgcagccat aacagcaca atacagaaag cgaaattacc aaccacgctc 180  
gaaatcgatg caaacgcta cggttttgaa agagattccg ttattttgct ggagcaaatt 240  
cggacgattg acaagcaaag gttaacggat aagattactc atctggatga tgaaatgatg 300  
gataagggtt atgaagcctt acaaatcagt ttggcactca ttgattttta g 351

<210> 43

<211> 324

<212> DNA

<213> *Neisseria meningitides*

<400> 43

atggatatgg tagtacgcgg cggaatctat ctggtctcct tagacccgac cgtaggaagc 60  
gaaatcaaaa agacacgtcc ttgtgtcgtg gtctctctc ctgaaatata caactatctc 120  
aagactgtgc tgatcggtcc catgacgagc ggaagccgct ctgcccgtt ccgcgtcaat 180  
gtccgctttc aggataaaga cggttttgct ttgcccgaac agattagggc tgtggataaa 240  
gccggattgg tcaaacatct tggcaattta gacaacagta cggctgaaaa actgtttgca 300  
gtattgcagg agatgtttgc ctga 324

<210> 44

<211> 366

<212> DNA

<213> *Morganella morganii*

<400> 44

atgcgccggc ggctgggtcag gaggaatct gacatggaaa gaggggaaat ctggcttgtc 60  
tcgcttgacc ctaccgcagg tcatgagcag caggggaacgc ggccggtact gattgtcacg 120  
ccggctgctt ttaaccgcgt gaccgcctg cctgttggtg tgcccgtagc cagcggaggt 180  
aattttgccc gcacagcagg ctttgctgtg tcgcttgacg gcgccggcat acgtaccacc 240  
ggcgttggtc gttgcgatca accccggacg atcgatatga aagcccgcg cggcaaacga 300  
ctcgaacggg tgccagagac tatcatggac gacgttcttg gccgtctggc caccatcctg 360  
acctga 366

<210> 45

<211> 321

<212> DNA

<213> *Mycobacterium tuberculosis*

<400> 45

gtggtgattc ggggagcggc ctacagggtc gacttcggcg atgcgaagcg aggccacgag 60

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caacgcgggc ggcgctacgc cgtgggtcatc agccccggct cgatgccgtg gagtgtagta 120
accgtgggtgc cgacgtcgac aagcgcccaa cctgcggttt tccgaccaga gctggaagtc 180
atgggaacaa agacacgggt cctgggtggat cagatccgga cgatcggcat cgtctatgtg 240
cacggcgatc cggtcgacta tctggaccgt gaccaaattgg ccaaggtgga acacgccgtg 300
gcacgatacc ttggtctgtg a

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&lt;210&gt; 46

&lt;211&gt; 109

&lt;212&gt; PRT

<213> *Bacillus halodurans*

&lt;400&gt; 46

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Met Pro Val Pro Asp Arg Gly Asn Leu Val Tyr Val Asp Phe Asn Pro
 1          5          10          15
Gln Ser Gly His Asp Gln Ala Gly Thr Arg Pro Ala Ile Val Leu Ser
          20          25          30
Pro Lys Leu Phe Asn Lys Asn Thr Gly Phe Ala Val Val Cys Pro Ile
          35          40          45
Thr Arg Gln Gln Lys Gly Tyr Pro Phe Glu Ile Glu Ile Pro Pro Gly
 50          55          60
Leu Pro Ile Glu Gly Val Ile Leu Thr Asp Gln Val Lys Ser Leu Asp
 65          70          75          80
Trp Arg Ala Arg Asn Phe His Ile Lys Gly Gln Ala Pro Glu Glu Thr
          85          90          95
Val Thr Asp Cys Leu Gln Leu Ile His Thr Phe Leu Ser
          100          105

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&lt;210&gt; 47

&lt;211&gt; 120

&lt;212&gt; PRT

<213> *Staphylococcus epidermidis*

&lt;400&gt; 47

```

Met Ile Arg Arg Gly Asp Val Tyr Leu Ala Asp Leu Ser Pro Val Gln
 1          5          10          15
Gly Ser Glu Gln Gly Gly Val Arg Pro Val Val Ile Ile Gln Asn Asp
          20          25          30
Thr Gly Asn Lys Tyr Ser Pro Thr Val Ile Val Ala Ala Ile Thr Asp
          35          40          45
Gly Ile Asn Lys Ala Lys Ile Pro Thr His Val Glu Ile Glu Lys Lys
 50          55          60
Lys Tyr Lys Leu Asp Lys Asp Ser Val Ile Leu Leu Glu Gln Ile Arg
 65          70          75          80
Thr Leu Asp Lys Lys Arg Leu Lys Glu Lys Leu Thr Phe Leu Ser Glu
          85          90          95
Ser Lys Met Ile Glu Val Asp Asn Ala Leu Asp Ile Ser Leu Gly Leu
          100          105          110
Asn Asn Phe Asp His His Lys Ser
          115          120

```

&lt;210&gt; 48

&lt;211&gt; 136

&lt;212&gt; PRT

<213> *Staphylococcus aureus*

&lt;400&gt; 48

```

Met Ile Arg Arg Gly Asp Val Tyr Leu Ala Asp Leu Ser Pro Val Gln
 1          5          10          15
Gly Ser Glu Gln Gly Gly Val Arg Pro Val Val Ile Ile Gln Asn Asp
          20          25          30
Thr Gly Asn Lys Tyr Ser Pro Thr Val Ile Val Ala Ala Ile Thr Gly
          35          40          45
Arg Ile Asn Lys Ala Lys Ile Pro Thr His Val Glu Ile Glu Lys Lys
 50          55          60

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Lys Tyr Lys Leu Asp Lys Asp Ser Val Ile Leu Leu Glu Gln Ile Arg  
 65 70 75 80  
 Thr Leu Asp Lys Lys Arg Leu Lys Glu Lys Leu Thr Tyr Leu Ser Asp  
 85 90 95  
 Asp Lys Met Lys Glu Val Asp Asn Ala Leu Met Ile Ser Leu Gly Leu  
 100 105 110  
 Asn Ala Val Ala Gln Pro Glu Lys Leu Gly Val Tyr Tyr Met Tyr Phe  
 115 120 125  
 Ser Glu Ile Asn Lys Ile Leu Ile  
 130 135

<210> 49  
 <211> 116  
 <212> PRT  
 <213> *Bacillus subtilis*

<400> 49  
 Met Ile Val Lys Arg Gly Asp Val Tyr Phe Ala Asp Leu Ser Pro Val  
 1 5 10 15  
 Val Gly Ser Glu Gln Gly Gly Val Arg Pro Val Leu Val Ile Gln Asn  
 20 25 30  
 Asp Ile Gly Asn Arg Phe Ser Pro Thr Ala Ile Val Ala Ala Ile Thr  
 35 40 45  
 Ala Gln Ile Gln Lys Ala Lys Leu Pro Thr His Val Glu Ile Asp Ala  
 50 55 60  
 Lys Arg Tyr Gly Phe Glu Arg Asp Ser Val Ile Leu Leu Glu Gln Ile  
 65 70 75 80  
 Arg Thr Ile Asp Lys Gln Arg Leu Thr Asp Lys Ile Thr His Leu Asp  
 85 90 95  
 Asp Glu Met Met Asp Lys Val Asp Glu Ala Leu Gln Ile Ser Leu Ala  
 100 105 110  
 Leu Ile Asp Phe  
 115

<210> 50  
 <211> 115  
 <212> PRT  
 <213> *Neisseria meningitides*

<400> 50  
 Met Tyr Ile Pro Asp Lys Gly Asp Ile Phe His Leu Asn Phe Asp Pro  
 1 5 10 15  
 Ser Ser Gly Lys Glu Ile Lys Gly Gly Arg Phe Ala Leu Ala Leu Ser  
 20 25 30  
 Pro Lys Ala Phe Asn Arg Ala Thr Gly Leu Val Phe Ala Cys Pro Ile  
 35 40 45  
 Ser Gln Gly Asn Ala Ala Ala Arg Ser Ser Gly Met Ile Ser Thr  
 50 55 60  
 Leu Leu Gly Ala Gly Thr Glu Thr Gln Gly Asn Val His Cys His Gln  
 65 70 75 80  
 Leu Lys Ser Leu Asp Trp Gln Ile Arg Lys Ala Ser Phe Lys Glu Thr  
 85 90 95  
 Val Pro Asp Tyr Val Leu Asp Asp Val Leu Ala Arg Ile Gly Ala Val  
 100 105 110  
 Leu Phe Asp  
 115

<210> 51  
 <211> 121  
 <212> PRT  
 <213> *Morganella morganii*

<400> 51  
 Met Arg Arg Arg Leu Val Arg Arg Lys Ser Asp Met Glu Arg Gly Glu  
 1 5 10 15  
 Ile Trp Leu Val Ser Leu Asp Pro Thr Ala Gly His Glu Gln Gln Gly  
 20 25 30  
 Thr Arg Pro Val Leu Ile Val Thr Pro Ala Ala Phe Asn Arg Val Thr  
 35 40 45  
 Arg Leu Pro Val Val Val Pro Val Thr Ser Gly Gly Asn Phe Ala Arg  
 50 55 60  
 Thr Ala Gly Phe Ala Val Ser Leu Asp Gly Ala Gly Ile Arg Thr Thr  
 65 70 75 80  
 Gly Val Val Arg Cys Asp Gln Pro Arg Thr Ile Asp Met Lys Ala Arg  
 85 90 95  
 Gly Gly Lys Arg Leu Glu Arg Val Pro Glu Thr Ile Met Asp Asp Val  
 100 105 110  
 Leu Gly Arg Leu Ala Thr Ile Leu Thr  
 115 120

<210> 52  
 <211> 118  
 <212> PRT  
 <213> *Mycobacterium tuberculosis*

<400> 52  
 Met Met Arg Arg Gly Glu Ile Trp Gln Val Asp Leu Asp Pro Ala Arg  
 1 5 10 15  
 Gly Ser Glu Ala Asn Asn Gln Arg Pro Ala Val Val Val Ser Asn Asp  
 20 25 30  
 Arg Ala Asn Ala Thr Ala Thr Arg Leu Gly Arg Gly Val Ile Thr Val  
 35 40 45  
 Val Pro Val Thr Ser Asn Ile Ala Lys Val Tyr Pro Phe Gln Val Leu  
 50 55 60  
 Leu Ser Ala Thr Thr Thr Gly Leu Gln Val Asp Cys Lys Ala Gln Ala  
 65 70 75 80  
 Glu Gln Ile Arg Ser Ile Ala Thr Glu Arg Leu Leu Arg Pro Ile Gly  
 85 90 95  
 Arg Val Ser Ala Ala Glu Leu Ala Gln Leu Asp Glu Ala Leu Lys Leu  
 100 105 110  
 His Leu Asp Leu Trp Ser  
 115

<210> 53  
 <211> 243  
 <212> DNA  
 <213> *Deinococcus radiodurans*

<400> 53  
 atgacgagtc aaattcagaa atggggcaac agcctcgcg cccgcattcc caaagctctg 60  
 gcgcagcagg tgggactgac gcagagttca gaagtggagc tgctttcttca ggacgggtcag 120  
 attgtcatcc ggccagttcc tgctcggcag tacgatctcg ccgcgctgct ggccgaaatg 180  
 acacctgaaa atctgcatgg ggaaacagac tggggcgcac tggaaggacg cgaggaatgg 240  
 taa 243

<210> 54  
 <211> 246  
 <212> DNA  
 <213> *Bacillus halodurans*

<400> 54  
 gtgacactca tgactactat acaaaagtgg ggaaatagtt tagctgttcg tattccgaac 60  
 cattatgcta aacatattaa cgttacgcaa ggatctgaaa ttgaactaag cttagggagt 120  
 gatcaaacga ttatttttaa gcctaaaaaa agaaagccaa cattagagga attagtggca 180  
 aaaatcactc ctgaaaacag acataacgaa attgatttcg ggagaacagg aaaggaattg 240  
 ttgttaa 246

<210> 55  
 <211> 258  
 <212> DNA  
 <213> *E. coli* Plasmid R100

<400> 55  
 atgcatacca cccgactgaa gaggggttggc ggctcagtta tgctgaccgt cccaccggca 60  
 ctgctgaatg cgctgtctct gggcacagat aatgaagttg gcatgggtcat tgataatggc 120  
 cggctgattg ttgagccgta cagacgcccc caatattcac tggctgagct actggcacag 180  
 tgtgatccga atgctgaaat atcagctgaa gaacgagaat ggctggatgc accggcgact 240  
 ggtcaggagg aaatctga 258

<210> 56  
 <211> 294  
 <212> DNA  
 <213> *E. coli* Plasmid R466b

<400> 56  
 atgttatatt taaatataac ttttatggag ggaaaaatgc ataccactcg actgaagaag 60  
 gttggcggct cagtcattgct gaccgtccca cccgcactgc tgaatgcgct gtcgctgggt 120  
 acagataatg aagttggcat ggtcattgat aatggccggc tgattgtgga gccgcacaga 180  
 cgcccgcagt attcactggc tgagctgttg gcacagtgcg atccgaacgc tgaaatctcg 240  
 gcagaagaac gtgaatggct ggatgcgcgc gccgctggtc aggaggaaat ctga 294

<210> 57  
 <211> 258  
 <212> DNA  
 <213> *Escherichia coli*

<400> 57  
 gtgcagatgc gtattaccat aaaaagatgg gggaacagtg caggatatggt cattcccaat 60  
 atcgtaatga aagaacttaa cttacagccg gggcagagcg tggagtgca ggtgagcaac 120  
 aaccaactga ttctgacacc catctccagg cgctactcgc ttgatgaact gctggcacag 180  
 tgtgacatga acgccgcgga acttagcgag caggatgtct ggggtaaatc caccctgcg 240  
 ggtgacgaaa tatggtaa 258

<210> 58  
 <211> 255  
 <212> DNA  
 <213> *Pseudomonas putida*

<400> 58  
 atgcagatca agattcaaca gtggggcaac agcgccgcga tccgcttgcc cgccgcagta 60  
 ctcaagcaga tgcgcctcgg tgcgggtccc accctgagcc ttgacacaac gggtagagacg 120  
 atggtgctca aaccgctcag gtcgaaaccc aagtacaccc ttgaggaact gatggcccag 180  
 tgtgacctga gtgcaccgga gccagaggac atggccgact ggaatgccat gcgcccagtg 240  
 gggcgtgaag tgtga 255

<210> 59  
 <211> 260  
 <212> DNA  
 <213> Photobacterium profundum

<400> 59  
 gtgcaatgag aactcagata agaaagatcg gtaactcact tgggttcaatt attcctgcca 60  
 cttttattcg tcagcttgaa ctggcagagg gcgcagaaat tgatgttaaa acggttgatg 120  
 gaaaaattgt gattgagcca attagaaaaa tgaaaaaacg tttcccatc agtgagcgtg 180  
 aattactaag tggattggat gcacacactg ctcatgctga cgaactgggtt gtaatttcta 240  
 cccaggagct aggcgaataa 260

<210> 60  
 <211> 80  
 <212> PRT  
 <213> Deinococcus radiodurans

<400> 60  
 Met Thr Ser Gln Ile Gln Lys Trp Gly Asn Ser Leu Ala Leu Arg Ile  
 1 5 10 15  
 Pro Lys Ala Leu Ala Gln Gln Val Gly Leu Thr Gln Ser Ser Glu Val  
 20 25 30  
 Glu Leu Leu Leu Gln Asp Gly Gln Ile Val Ile Arg Pro Val Pro Ala  
 35 40 45  
 Arg Gln Tyr Asp Leu Ala Ala Leu Leu Ala Glu Met Thr Pro Glu Asn  
 50 55 60  
 Leu His Gly Glu Thr Asp Trp Gly Ala Leu Glu Gly Arg Glu Glu Trp  
 65 70 75 80

<210> 61  
 <211> 81  
 <212> PRT  
 <213> Bacillus halodurans

<400> 61  
 Met Thr Leu Met Thr Thr Ile Gln Lys Trp Gly Asn Ser Leu Ala Val  
 1 5 10 15  
 Arg Ile Pro Asn His Tyr Ala Lys His Ile Asn Val Thr Gln Gly Ser  
 20 25 30  
 Glu Ile Glu Leu Ser Leu Gly Ser Asp Gln Thr Ile Ile Leu Lys Pro  
 35 40 45  
 Lys Lys Arg Lys Pro Thr Leu Glu Glu Leu Val Ala Lys Ile Thr Pro  
 50 55 60  
 Glu Asn Arg His Asn Glu Ile Asp Phe Gly Arg Thr Gly Lys Glu Leu  
 65 70 75 80  
 Leu

<210> 62  
 <211> 85  
 <212> PRT  
 <213> E. coli PemI plasmid R100

<400> 62  
 Met His Thr Thr Arg Leu Lys Arg Val Gly Gly Ser Val Met Leu Thr  
 1 5 10 15  
 Val Pro Pro Ala Leu Leu Asn Ala Leu Ser Leu Gly Thr Asp Asn Glu  
 20 25 30  
 Val Gly Met Val Ile Asp Asn Gly Arg Leu Ile Val Glu Pro Tyr Arg  
 35 40 45  
 Arg Pro Gln Tyr Ser Leu Ala Glu Leu Leu Ala Gln Cys Asp Pro Asn  
 50 55 60  
 Ala Glu Ile Ser Ala Glu Glu Arg Glu Trp Leu Asp Ala Pro Ala Thr  
 65 70 75 80

Gly Gln Glu Glu Ile  
85

<210> 63  
<211> 97  
<212> PRT  
<213> E. coli PemI plasmid R466b

<400> 63  
Met Leu Tyr Leu Asn Ile Thr Phe Met Glu Gly Lys Met His Thr Thr  
1 5 10 15  
Arg Leu Lys Lys Val Gly Gly Ser Val Met Leu Thr Val Pro Pro Ala  
20 25 30  
Leu Leu Asn Ala Leu Ser Leu Gly Thr Asp Asn Glu Val Gly Met Val  
35 40 45  
Ile Asp Asn Gly Arg Leu Ile Val Glu Pro His Arg Arg Pro Gln Tyr  
50 55 60  
Ser Leu Ala Glu Leu Leu Ala Gln Cys Asp Pro Asn Ala Glu Ile Ser  
65 70 75 80  
Ala Glu Glu Arg Glu Trp Leu Asp Ala Pro Ala Ala Gly Gln Glu Glu  
85 90 95  
Ile

<210> 64  
<211> 85  
<212> PRT  
<213> Escherichia coli

<400> 64  
Met Gln Met Arg Ile Thr Ile Lys Arg Trp Gly Asn Ser Ala Gly Met  
1 5 10 15  
Val Ile Pro Asn Ile Val Met Lys Glu Leu Asn Leu Gln Pro Gly Gln  
20 25 30  
Ser Val Glu Ala Gln Val Ser Asn Asn Gln Leu Ile Leu Thr Pro Ile  
35 40 45  
Ser Arg Arg Tyr Ser Leu Asp Glu Leu Leu Ala Gln Cys Asp Met Asn  
50 55 60  
Ala Ala Glu Leu Ser Glu Gln Asp Val Trp Gly Lys Ser Thr Pro Ala  
65 70 75 80  
Gly Asp Glu Ile Trp  
85

<210> 65  
<211> 84  
<212> PRT  
<213> Pseudomonas putida

<400> 65  
Met Gln Ile Lys Ile Gln Gln Trp Gly Asn Ser Ala Ala Ile Arg Leu  
1 5 10 15  
Pro Ala Ala Val Leu Lys Gln Met Arg Leu Gly Val Gly Ser Thr Leu  
20 25 30  
Ser Leu Asp Thr Thr Gly Glu Thr Met Val Leu Lys Pro Val Arg Ser  
35 40 45  
Lys Pro Lys Tyr Thr Leu Glu Glu Leu Met Ala Gln Cys Asp Leu Ser  
50 55 60  
Ala Pro Glu Pro Glu Asp Met Ala Asp Trp Asn Ala Met Arg Pro Val  
65 70 75 80  
Gly Arg Glu Val

<210> 66  
 <211> 85  
 <212> PRT  
 <213> Photobacterium profundum

<400> 66  
 Ala Met Arg Thr Gln Ile Arg Lys Ile Gly Asn Ser Leu Gly Ser Ile  
 1 5 10 15  
 Ile Pro Ala Thr Phe Ile Arg Gln Leu Glu Leu Ala Glu Gly Ala Glu  
 20 25 30  
 Ile Asp Val Lys Thr Val Asp Gly Lys Ile Val Ile Glu Pro Ile Arg  
 35 40 45  
 Lys Met Lys Lys Arg Phe Pro Phe Ser Glu Arg Glu Leu Leu Ser Gly  
 50 55 60  
 Leu Asp Ala His Thr Ala His Ala Asp Glu Leu Val Val Ile Ser Thr  
 65 70 75 80  
 Gln Glu Leu Gly Glu  
 85

<210> 67  
 <211> 228  
 <212> DNA  
 <213> Homo sapiens

<400> 67  
 atgggtccag catctgttcc gactacctgt tgctttaacc tggcgaaccg caaaattccg 60  
 ctgcagcgcc tggaaaagcta tcgccgtatt acctctggca aatgcccgca gaaagcgggtg 120  
 atctttaaaa ccaaactggc gaaagatatt tgccgcggatc cgaaaaaaaa atgggtgcag 180  
 gattctatga aatatctgga tcagaaatct ccgaccccgga aaccgtaa 228

<210> 68  
 <211> 73  
 <212> PRT  
 <213> Homo sapiens

<400> 68  
 Gly Pro Ala Ser Pro Thr Thr Cys Cys Phe Asn Leu Ala Asn Arg Lys  
 1 5 10 15  
 Ile Pro Leu Gln Arg Leu Glu Ser Tyr Arg Arg Ile Thr Ser Gly Lys  
 20 25 30  
 Cys Pro Gln Lys Ala Val Ile Phe Lys Thr Lys Leu Ala Lys Asp Ile  
 35 40 45  
 Cys Ala Asp Pro Lys Lys Lys Trp Val Gln Asp Ser Met Lys Tyr Leu  
 50 55 60  
 Asp Gln Lys Ser Pro Thr Pro Lys Pro  
 65 70

<210> 69  
 <211> 357  
 <212> DNA  
 <213> Mycobacterium tuberculosis

<400> 69  
 gtgatgcgcc gcggtgagat ttggcaggtc gatctcgacc ccgctcgagg tagcgaagcg 60  
 aacaaccagc gccccgccgt cgtcgtcagc aacgaccggg ccaacgcgac cgccacgcgt 120  
 cttggggcgcg gcgtcatcac cgctcgtgccg gtgacgagca acatcgcaa ggtctatccg 180  
 tttcagggtgt tgttgtcggc caccactact ggtctccagg tcgactgcaa ggcgcaggcc 240  
 gagcaaatca gatcgattgc taccgagcgg ttgctccggc caatcggccg agtttcagcc 300  
 gccgaacttg ccagctcga tgaggctttg aaactgcac tcgacttatg gtcgtag 357



<210> 70  
 <211> 282  
 <212> DNA  
 <213> Mycobacterium tuberculosis

<400> 70  
 atgctgcgcg gtgagatctg gcaggctgcac ctggatccgg cccgcggcag cgcggcaaatt 60  
 atgcggcggc cagcggtaatt tgtcagcaac gacagggcca acgctgccgc gatacgtctc 120  
 gaccgaggcg tggcgccggg tgtcccgggt accagcaaca ccgaaaagggt ccccatcca 180  
 ggtgttgttg ccggcagcga gcggtggcct ggccgtcgat tcgaaggcgc aggcccagca 240  
 ggttgatcc gtcgctgcgc aacgtctccc ctgccgagct ga 282

<210> 71  
 <211> 345  
 <212> DNA  
 <213> Mycobacterium tuberculosis

<400> 71  
 gtggtgatta gtcgtgccga gatctactgg gctgacctcg ggccgccatc aggcagtcag 60  
 ccggcgaagc gccgcccggg gtcgtgaatc cagtcagatc cgtacaacgc aagtcgcctt 120  
 gccactgtga tcgcagcggg gatcacgtcc aatacggcgc tggcggcaat gcccggaac 180  
 gtgttcttgc ccgcgaccac aacgcgactg ccacgtgact cggtcgtcaa cgtcacggcg 240  
 attgtcacgc tcaacaagac tgacctcacc gaccgagttg gggaggtgcc agcgagcttg 300  
 atgcacgagg ttgaccgagg acttcgtcgc gtactggacc ttga 345

<210> 72  
 <211> 309  
 <212> DNA  
 <213> Mycobacterium tuberculosis

<400> 72  
 atgcggcgcg gtgaattgtg gtttgccgcc acacctgggtg gtgacagacc agtacttgtc 60  
 cttaccagag atccgggtggc agaccgcac gccgcgggtcg ttgtggtggc cctaaccgc 120  
 acccgccgag gcctggtgtc ggaattggag ctacggccg tcgaaaaccg tggtccgagc 180  
 gactgcgtcg tcaacttcga caacattcat acgttgccac gcaccgcatt ccgacgccgc 240  
 atcaccggcg tgtcccggc ccgcctgcac gaagcctgtc aaacactccg ggcgagcacg 300  
 ggggtgttga 309

<210> 73  
 <211> 330  
 <212> DNA  
 <213> Mycobacterium tuberculosis

<400> 73  
 gtgaccgcac ttcggcgcg cggagaggtg tgggtggtgtg agatggctga gatcggtcgg 60  
 cgaccagtcg tcgtgctgtc gcgcgatgcc gcgatccctc ggctgcgacg cgcacttgtc 120  
 gcgcccctgca ccacgaccat ccgagggcta gccagtggagg ttgttcttga acccggttcc 180  
 gacccgatcc cgcgccgttc cgcggtgaat ttggactcag tcgaaagtgt ctcggtcgcg 240  
 gtattggtga atcggcttgg ccgcctcgcc gacatccgga tgcgcgccat ctgcacggcc 300  
 ctcgaggctg ccgtcgattg ctctcgatga 330

<210> 74  
 <211> 118  
 <212> PRT  
 <213> Mycobacterium tuberculosis

<400> 74  
 Met Met Arg Arg Gly Glu Ile Trp Gln Val Asp Leu Asp Pro Ala Arg  
 1 5 10 15  
 Gly Ser Glu Ala Asn Asn Gln Arg Pro Ala Val Val Val Ser Asn Asp  
 20 25 30  
 Arg Ala Asn Ala Thr Ala Thr Arg Leu Gly Arg Gly Val Ile Thr Val  
 35 40 45  
 Val Pro Val Thr Ser Asn Ile Ala Lys Val Tyr Pro Phe Gln Val Leu  
 50 55 60

Leu Ser Ala Thr Thr Thr Gly Leu Gln Val Asp Cys Lys Ala Gln Ala  
 65 70 75 80  
 Glu Gln Ile Arg Ser Ile Ala Thr Glu Arg Leu Leu Arg Pro Ile Gly  
 85 90 95  
 Arg Val Ser Ala Ala Glu Leu Ala Gln Leu Asp Glu Ala Leu Lys Leu  
 100 105 110  
 His Leu Asp Leu Trp Ser  
 115

<210> 75  
 <211> 93  
 <212> PRT  
 <213> Mycobacterium tuberculosis

<400> 75  
 Met Leu Arg Gly Glu Ile Trp Gln Val Asp Leu Asp Pro Ala Arg Gly  
 1 5 10 15  
 Ser Ala Ala Asn Met Arg Arg Pro Ala Val Ile Val Ser Asn Asp Arg  
 20 25 30  
 Ala Asn Ala Ala Ala Ile Arg Leu Asp Arg Gly Val Val Pro Val Val  
 35 40 45  
 Pro Val Thr Ser Asn Thr Glu Lys Val Pro Ile Pro Gly Val Val Ala  
 50 55 60  
 Gly Ser Glu Arg Trp Pro Gly Arg Arg Phe Glu Gly Ala Gly Pro Ala  
 65 70 75 80  
 Gly Trp Ile Arg Arg Cys Ala Thr Ser Pro Leu Pro Ser  
 85 90

<210> 76  
 <211> 114  
 <212> PRT  
 <213> Mycobacterium tuberculosis

<400> 76  
 Met Val Ile Ser Arg Ala Glu Ile Tyr Trp Ala Asp Leu Gly Pro Pro  
 1 5 10 15  
 Ser Gly Ser Gln Pro Ala Lys Arg Arg Pro Val Leu Val Ile Gln Ser  
 20 25 30  
 Asp Pro Tyr Asn Ala Ser Arg Leu Ala Thr Val Ile Ala Val Ile  
 35 40 45  
 Thr Ser Asn Thr Ala Leu Ala Ala Met Pro Gly Asn Val Phe Leu Pro  
 50 55 60  
 Ala Thr Thr Thr Arg Leu Pro Arg Asp Ser Val Val Asn Val Thr Ala  
 65 70 75 80  
 Ile Val Thr Leu Asn Lys Thr Asp Leu Thr Asp Arg Val Gly Glu Val  
 85 90 95  
 Pro Ala Ser Leu Met His Glu Val Asp Arg Gly Leu Arg Arg Val Leu  
 100 105 110  
 Asp Leu

<210> 77  
 <211> 102  
 <212> PRT  
 <213> Mycobacterium tuberculosis

<400> 77  
 Met Arg Arg Gly Glu Leu Trp Phe Ala Ala Thr Pro Gly Gly Asp Arg  
 1 5 10 15  
 Pro Val Leu Val Leu Thr Arg Asp Pro Val Ala Asp Arg Ile Gly Ala  
 20 25 30  
 Val Val Val Val Ala Leu Thr Arg Thr Arg Arg Gly Leu Val Ser Glu  
 35 40 45

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Leu Glu Leu Thr Ala Val Glu Asn Arg Val Pro Ser Asp Cys Val Val
 50      55      60
Asn Phe Asp Asn Ile His Thr Leu Pro Arg Thr Ala Phe Arg Arg Arg
65      70      75      80
Ile Thr Arg Leu Ser Pro Ala Arg Leu His Glu Ala Cys Gln Thr Leu
      85      90      95
Arg Ala Ser Thr Gly Cys
      100

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<210> 78  
 <211> 109  
 <212> PRT  
 <213> Mycobacterium tuberculosis

```

<400> 78
Met Thr Ala Leu Pro Ala Arg Gly Glu Val Trp Trp Cys Glu Met Ala
 1      5      10      15
Glu Ile Gly Arg Arg Pro Val Val Val Leu Ser Arg Asp Ala Ala Ile
      20      25      30
Pro Arg Leu Arg Arg Ala Leu Val Ala Pro Cys Thr Thr Thr Ile Arg
      35      40      45
Gly Leu Ala Ser Glu Val Val Leu Glu Pro Gly Ser Asp Pro Ile Pro
      50      55      60
Arg Arg Ser Ala Val Asn Leu Asp Ser Val Glu Ser Val Ser Val Ala
65      70      75      80
Val Leu Val Asn Arg Leu Gly Arg Leu Ala Asp Ile Arg Met Arg Ala
      85      90      95
Ile Cys Thr Ala Leu Glu Val Ala Val Asp Cys Ser Arg
      100      105

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<210> 79  
 <211> 351  
 <212> DNA  
 <213> Bacillus anthracis

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<400> 79
ttgattgtaa aacgcggcga cgtgtatttt gcagaccttt cccagttgt tggttctgag 60
caaggagggtg ttctgtccggt tcttgtcatt caaaatgaca tcggaaatcg ttttagtcca 120
acggtgattg tagcggctat tactgcacag attcaaaaag cgaaattacc cactcatgtg 180
gaaattgatg cgaaaaagta cggttttgag agagattctg ttatttttact tgagcagatt 240
cgaacaatcg ataagcagcg cttaacggac aaaatcactc acttagatga agtgatgatg 300
attcgtgtag atgaagcgct acaaattagt ttaggactaa tagattttta a 351

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<210> 80  
 <211> 116  
 <212> PRT  
 <213> Bacillus anthracis

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<400> 80
Met Ile Val Lys Arg Gly Asp Val Tyr Phe Ala Asp Leu Ser Pro Val
 1      5      10      15
Val Gly Ser Glu Gln Gly Gly Val Arg Pro Val Leu Val Ile Gln Asn
      20      25      30
Asp Ile Gly Asn Arg Phe Ser Pro Thr Val Ile Val Ala Ala Ile Thr
      35      40      45
Ala Gln Ile Gln Lys Ala Lys Leu Pro Thr His Val Glu Ile Asp Ala
      50      55      60
Lys Lys Tyr Gly Phe Glu Arg Asp Ser Val Ile Leu Leu Glu Gln Ile
65      70      75      80
Arg Thr Ile Asp Lys Gln Arg Leu Thr Asp Lys Ile Thr His Leu Asp
      85      90      95
Glu Val Met Met Ile Arg Val Asp Glu Ala Leu Gln Ile Ser Leu Gly
      100      105      110

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Leu Ile Asp Phe  
115

<210> 81  
<211> 348  
<212> DNA  
<213> *Pseudomonas putida*

<400> 81  
gtgaaacggt tgaatttcgc caggggtgat attgttcgcg tcaacctgga cccaacagtc 60  
gggcgggaac agcagggctc cggccgacct gcaactggtac ttactccggc tgcgttcaat 120  
gcttcaggcc tggctgtaat catcccgatc actcaagggtg gggatttcgc gaggcattgcg 180  
ggtttcgctg tcacgctcag cgggtgcgggc acgcagactc aggggggtgat gctttgcaac 240  
caggtgcgca cagtcgacct tgaagcacga tttgccaagc gcatagagtc ggtgcctgaa 300  
gctgtcatcc tggatgcact ggcgcggtgtg caaacctat tcgattaa 348

<210> 82  
<211> 345  
<212> DNA  
<213> *Mycobacterium celatum*

<400> 82  
tgaattgctc tgacggaacg cggcgacatc tacatcgttt cgcttgaccc gacgtcggga 60  
catgagcaga gcggcacgcg cccagttattg gtctgtgtccc cgggcgcgctt taatcgcctg 120  
acgaaaacac cggtcgtgct acctataaca cgcggcggga actttgcccg aacggcaggg 180  
ttcgctgtct cgctgaccga tgcgggtact cgcaccgcgg gcgtaatacg ctgcgatcag 240  
cctcgctcga ttgatatccg cgcccgtaaa ggccgcaagg ttgaacgtgt gccgtctggg 300  
gttcttgacg aagcgttggc caagctcgcc acgatcttga cttga 345

<210> 83  
<211> 366  
<212> DNA  
<213> *Shigella flexneri* 2a str. 301

<400> 83  
atggtaaagg cacggacgcc acatcgtggt gagatctggt attttaaccc tgatccgggtt 60  
gccgggcatg aacttcaggg gccacattat tgcattgtgg taacggacaa aaaactcaac 120  
aatgttttaa aagttgctat gtgctgcccg atttcaacag gggcaaattgc agcacgttcc 180  
acaggggtga cgggtgaacgt cctcccccggt gatacgcaaa ccggtaacct gcatggcggtt 240  
gtactttgtc accagctaaa agccgtcgat cttattgccc gtggcgctaa atttcatacc 300  
gttgccgatg aaaaattgat tagtgaagtt atcagtaaac tgggtgaattt aatcgaccca 360  
caataa 366

<210> 84  
<211> 351  
<212> DNA  
<213> *E. coli*

<400> 84  
atggtaaaga aaagtgaatt tgaacgggga gacattgtgc tggttggctt tgatccagca 60  
agcggccatg aacagcaagg tgctggtcga cctgcgcttg tgctctccgt tcaagccttt 120  
aatcaactgg gaatgacgct ggtggccccc attacgcagg gcggaaattt tgcccgttat 180  
gccggattta gcgttccttt acattgcgaa gaaggcgatg tgcacggcgt ggtgctggtg 240  
aatcaggtgc ggatgatgga tctacacgcc cggctggcaa agcgtattgg tctggctgcy 300  
gatgaggtgg tggaagaggc gttattacgc ttgcaggcgg tgggtggaata a 351

<210> 85  
<211> 115  
<212> PRT  
<213> *Pseudomonas putida*

<400> 85  
Met Lys Arg Leu Lys Phe Ala Arg Gly Asp Ile Val Arg Val Asn Leu  
1 5 10 15

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Asp Pro Thr Val Gly Arg Glu Gln Gln Gly Ser Gly Arg Pro Ala Leu
      20      25      30
Val Leu Thr Pro Ala Ala Phe Asn Ala Ser Gly Leu Ala Val Ile Ile
      35      40      45
Pro Ile Thr Gln Gly Gly Asp Phe Ala Arg His Ala Gly Phe Ala Val
      50      55      60
Thr Leu Ser Gly Ala Gly Thr Gln Thr Gln Gly Val Met Leu Cys Asn
      65      70      75      80
Gln Val Arg Thr Val Asp Leu Glu Ala Arg Phe Ala Lys Arg Ile Glu
      85      90      95
Ser Val Pro Glu Ala Val Ile Leu Asp Ala Leu Ala Arg Val Gln Thr
      100      105      110
Leu Phe Asp
      115

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<210> 86  
 <211> 111  
 <212> PRT  
 <213> Mycobacterium celatum

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<400> 86
Met Thr Glu Arg Gly Asp Ile Tyr Ile Val Ser Leu Asp Pro Thr Ser
  1      5      10      15
Gly His Glu Gln Ser Gly Thr Arg Pro Val Leu Val Val Ser Pro Gly
      20      25      30
Ala Phe Asn Arg Leu Thr Lys Thr Pro Val Val Leu Pro Ile Thr Arg
      35      40      45
Gly Gly Asn Phe Ala Arg Thr Ala Gly Phe Ala Val Ser Leu Thr Asp
      50      55      60
Ala Gly Thr Arg Thr Ala Gly Val Ile Arg Cys Asp Gln Pro Arg Ser
      65      70      75      80
Ile Asp Ile Arg Ala Arg Lys Gly Arg Lys Val Glu Arg Val Pro Ser
      85      90      95
Gly Val Leu Asp Glu Ala Leu Ala Lys Leu Ala Thr Ile Leu Thr
      100      105      110

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<210> 87  
 <211> 121  
 <212> PRT  
 <213> Shigella flexneri 2a str. 301

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<400> 87
Met Val Lys Ala Arg Thr Pro His Arg Gly Glu Ile Trp Tyr Phe Asn
  1      5      10      15
Pro Asp Pro Val Ala Gly His Glu Leu Gln Gly Pro His Tyr Cys Ile
      20      25      30
Val Val Thr Asp Lys Lys Leu Asn Val Leu Lys Val Ala Met Cys
      35      40      45
Cys Pro Ile Ser Thr Gly Ala Asn Ala Ala Arg Ser Thr Gly Val Thr
      50      55      60
Val Asn Val Leu Pro Arg Asp Thr Gln Thr Gly Asn Leu His Gly Val
      65      70      75      80
Val Leu Cys His Gln Leu Lys Ala Val Asp Leu Ile Ala Arg Gly Ala
      85      90      95
Lys Phe His Thr Val Ala Asp Glu Lys Leu Ile Ser Glu Val Ile Ser
      100      105      110
Lys Leu Val Asn Leu Ile Asp Pro Gln
      115      120

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<210> 88  
 <211> 116  
 <212> PRT  
 <213> E. coli

<400> 88  
 Met Val Lys Lys Ser Glu Phe Glu Arg Gly Asp Ile Val Leu Val Gly  
 1 5 10 15  
 Phe Asp Pro Ala Ser Gly His Glu Gln Gly Ala Gly Arg Pro Ala  
 20 25 30  
 Leu Val Leu Ser Val Gln Ala Phe Asn Gln Leu Gly Met Thr Leu Val  
 35 40 45  
 Ala Pro Ile Thr Gln Gly Gly Asn Phe Ala Arg Tyr Ala Gly Phe Ser  
 50 55 60  
 Val Pro Leu His Cys Glu Gly Asp Val His Gly Val Val Leu Val  
 65 70 75 80  
 Asn Gln Val Arg Met Met Asp Leu His Ala Arg Leu Ala Lys Arg Ile  
 85 90 95  
 Gly Leu Ala Ala Asp Glu Val Val Glu Glu Ala Leu Leu Arg Leu Gln  
 100 105 110  
 Ala Val Val Glu  
 115

<210> 89  
 <211> 17  
 <212> RNA  
 <213> Artificial Sequence

<220>  
 <223> mRNA transcript

<400> 89  
 aatgatgaca ctggaag

17

<210> 90  
 <211> 17  
 <212> RNA  
 <213> Artificial Sequence

<220>  
 <223> mRNA transcript

<400> 90  
 gtcggtgaca ttgatgg

17

<210> 91  
 <211> 17  
 <212> RNA  
 <213> Artificial Sequence

<220>  
 <223> mRNA transcript

<400> 91  
 atctcgaaca cgcagcc

17

<210> 92  
 <211> 17  
 <212> RNA  
 <213> Artificial Sequence

<220>  
 <223> mRNA transcript

<400> 92  
 tcggttttaca cccttga

17